

PERCHLORATE UPDATE BY EPA REGION 9

I. What is perchlorate?

- Ammonium and potassium perchlorate
- Solid rocket fuel/explosive
- Inorganic salt; very soluble, very mobile, very stable in the environment

II. Why is it suddenly an issue?

- New test method: detection limit decreased from 400 ppb to 4 ppb in early 1997
- Found in Los Angeles and Las Vegas drinking water and in several drinking water wells in California

III. Health Concerns

- Thyroid inhibitor; formerly used as treatment for Graves disease (hyperthyroidism)
- Not believed to be a carcinogen
- Not much data on potential chronic effects, or potential effects on sensitive subpopulations (infants, chronically ill, etc)
- EPA provisional reference dose (4-18 ppb); California provisional drinking water Standard (18ppb)

IV. Drinking Water Issues

- Found in Lake Mead at about 10 ppb (LA and Las Vegas drinking water source)
- Drinking water wells: found in about 70 wells (measurable amounts); 23 wells at levels greater than 18 ppb; several wells have been shut down
- California is moving to require regular perchlorate monitoring by drinking water suppliers

V. Where is perchlorate coming from?

- Primarily DOD and NASA facilities and contractors
- Probable largest sources in Region 9: Kerr McGee and Pepcon at the BMI Complex in Henderson, NV.
- Superfund also looking at Aerojet (2), NASA JPL, Lockheed-Redlands and others
- RCRA looking at UTC, Rocketdyne SSFL, Whittaker-Bermite and others

VI. EPA Region 9 Activities

- Superfund: R9 lead, investigating several sites (including Pepcon), 9/23/97 memo to EPA-HQ
- RCRA: Looking at 4 sites (including Kerr McGee), for now (investigation, source control)
- Drinking Water: notification, guidance and sampling
- Activities and Issues: Coordination, information exchange, notification, testing, investigation, health effects, treatment options and source control

VII. Nevada DEP Activities

- Others have sampled for perchlorate in Lake Mead and Las Vegas Wash; results confirm that principal sources are located in the vicinity of BMI Complex
- Ground water has been sampled across the BMI Complex. Found as

- high as 18,000 ppm (Phase I investigation)
- Phase II investigation included more extensive gw sampling conducted by Kerr McGee. Report under review by NDEP and EPA R9
- Phase III investigation planned. To be conducted by Kerr McGee and overseen by NDEP. Hydrogeologic characterization to be conducted. Goal is for investigation to be completed by spring of 1998.
- Facilities are cooperative to date

VIII. September 23, 1997 Felicia Marcus Memo

- Requesting assistance from EPA-HQ.
 - * Identify potential areas of perchlorate contamination nationwide
 - * Develop national analytical protocols
 - * Increase toxicological information on perchlorate and expedite its evaluation
 - * Address technological and regulatory solutions to perchlorate in public drinking water supplies

IX. Likely Next Steps

- "Spread the word" to Regional offices and states
- Investigate additional sources of perchlorate
- Develop source control measures where needed (Kerr McGee and Pepcon at least)
- Investigate treatment options for drinking water and source control
- Continue to work on the toxicology of perchlorate (EPA research laboratories)

X. Potential Enforcement Authorities

- 7003: Imminent and Substantial Endangerment
 - * Can issue Administrative Order or initiate a Judicial action in U.S. District Court
 - * Can require assessment, interim measures, stabilization, long term clean-up work, controls on future operations, environmental restoration and cost recovery
 - * Similar to Section 106(a) of CERCLA
- 3008(h): RCRA enforcement authority for TSDF facilities under Interim Status. Also addresses contaminant investigation, characterization and corrective action/cleanup
- Nevada DEP could take its own enforcement actions
 - * Develop Consent Agreement for perchlorate between both companies and NDEP
 - * Modify a Consent Agreement already in effect which addresses chromium contamination at Kerr McGee

XI. EPA, Region 9 Contacts

- Superfund: Kevin Mayer (415) 744-2248
- RCRA: Mitch Kaplan (415) 744-2063
- Drinking Water: Bill Thurston (415) 744-1851

PERCHLORATE

Uses - Solid Rocket Fuel Component

Chemistry - Highly Oxidized Chlorine

- Dissociated Salt, Anion
- Highly Soluble, Mobile, Stable

Toxicology - Thyroid Disruption (Children!)

- Poorly Studied, Used as Drug
- Provisional Reference Dose
(Range 4 to 18 ppb)

Regulation - Not Regulated

- (SDWA, RCRA, CERCLA)
- California Interim Action Level
(18 ppb)

Testing for Perchlorate

- Standard Method for >400ppb
- CA method to 4 ppb in 1997

PERCHLORATE

Discovery in Water Supply Wells

- CA DHS Initiative
- February Discovery in Sacramento (Aerojet)
- March-June Survey in California
- Results at ~~Eight~~⁹ Areas in CA, 1 in UT

Discovery in Colorado River (5-9 ppb)

- Metropolitan Water District of So. California
- Traced to Lake Mead, 150 miles Upriver
- Water Supply for NV, AZ, CA, tribes

Major Sources in Nevada

- Kerr-McGee (BMI Complex)
- PEPCON Site (Destroyed 1988)
- Groundwater levels > 1,000 mg/L

Source(s) in Utah - Alliant (Hercules)

Sources Nationwide

Community Concerns

Congress

- House and Senate
- No one in favor of rocket fuel in DW

→ Other EPA Divisions + Regions } info sheet
- RCRA, Drinking Water, Cross Media, OCGR

States

- California - Support for their Actions
- Nevada - More general support

Local Water Suppliers - Metropolitan Water District → 17 million people (service area)

- Desperate for Information - 62 member agencies
 - Active lobbying of Congress, states { districts, cities
 - Want to say, "Water is safe!"
- potential lawsuit
- annual reporting requirements - don't have to report perchlorate - until 1998 - want to require ND by bleeding

Media

- Local news, Trade publications, Political
- Las Vegas stories, Press conferences
- Pressure from local officials ??

Citizens Groups

- Dispute that 18 ppb is "safe"
- Distrust "PRPs" to do toxicology
- Children, Elderly, EJ (Cost of treatment)

Individuals

- Need information, explanations
- Lake Havasu, Redlands, Sacto Fireman

Current Activities

Site Remediation

- Superfund Sites
- RCRA Sites
- State Sites (Nevada)

Communication with States, EPA (letters) Occurrence

Toxicology Research

- Air Force and Private Funding (\$1.4 M)
- EPA Review
- Animal Study for Sept/Oct 1998

Treatment Technologies

- East Valley Water District...AWWARF
(\$2 Million from EPA's OST Budget)
- Tech Support, Reviewing \$F Reports

Analytical Methods

- Tech Support, EPA NERL Lab

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Lessons

Firm Commitment from Management

- (See third point)

Develop Solid Information Team

- Toxicologists
- Analytical Chemists
- Water, RCRA, Childrens Health, Superfund

Be Sure of : 1) What we know

2) What we do NOT know

3) What we are doing

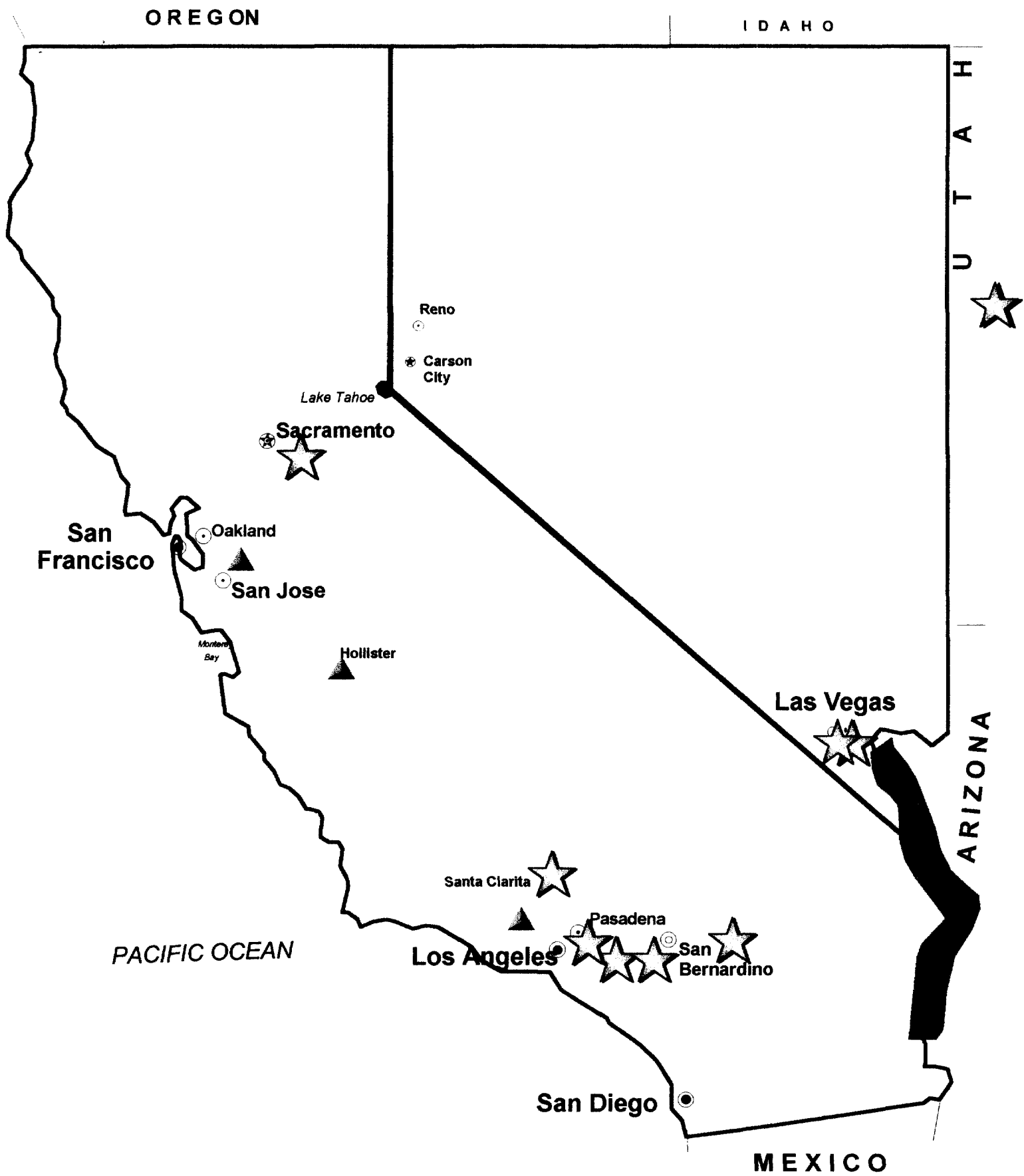
4) What we CAN do

Listen to the Public

- Their concerns are enlightening, important

Communicate Openly, Credibly

Try to Put "Agency Policy" into Writing

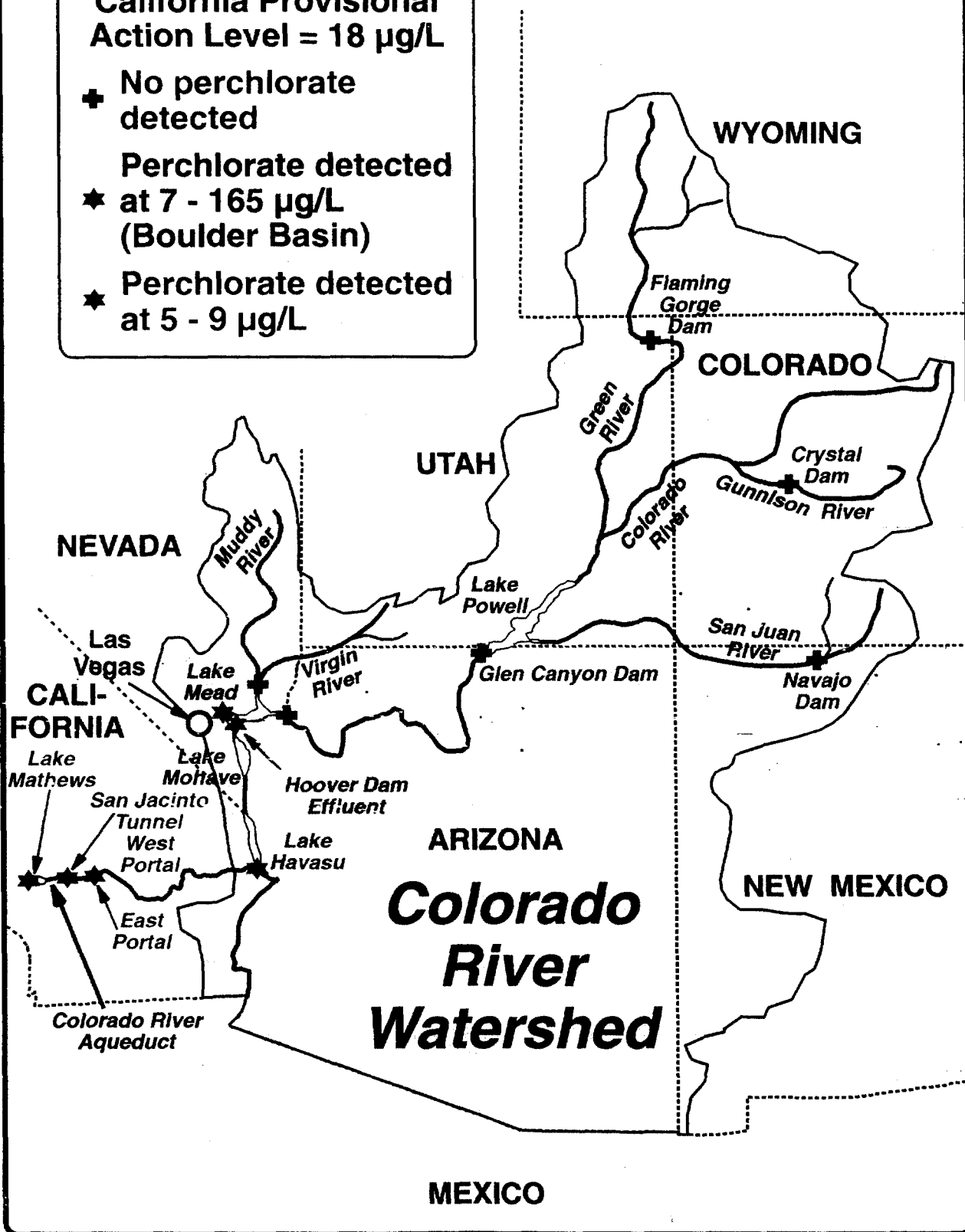


☆ - site of perchlorate Release - in public water supply wells
△ - " " " " - not currently in water supply.

Colorado-River - contamination 5-10 ppb.

**California Provisional
Action Level = 18 $\mu\text{g/L}$**

- + No perchlorate detected**
- ★ Perchlorate detected at 7 - 165 $\mu\text{g/L}$ (Boulder Basin)**
- ★ Perchlorate detected at 5 - 9 $\mu\text{g/L}$**

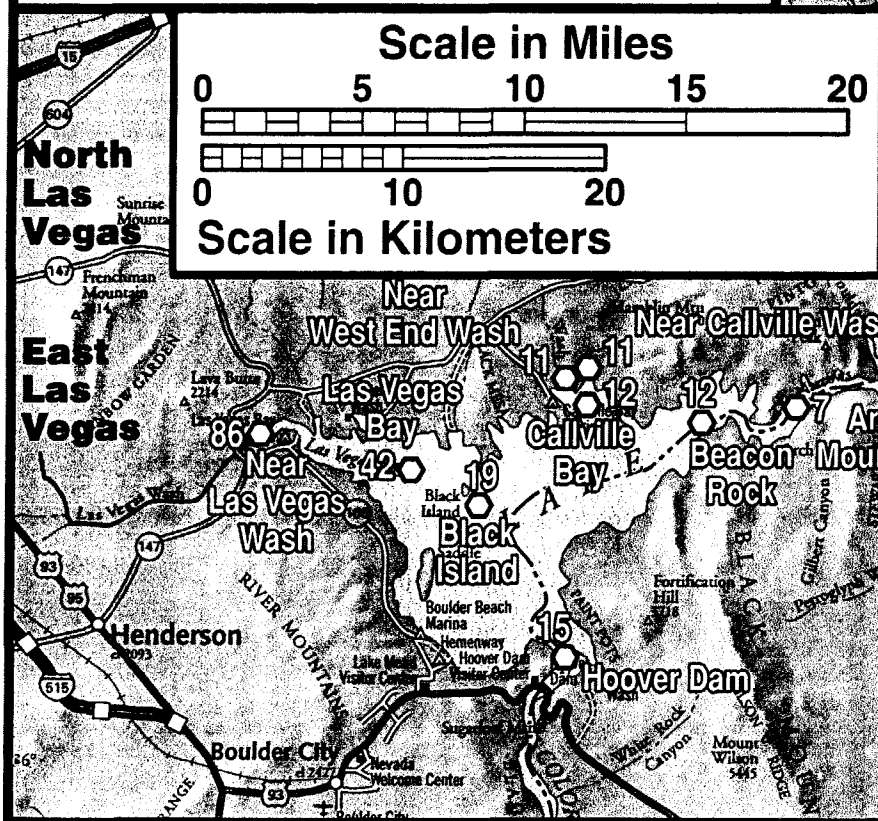
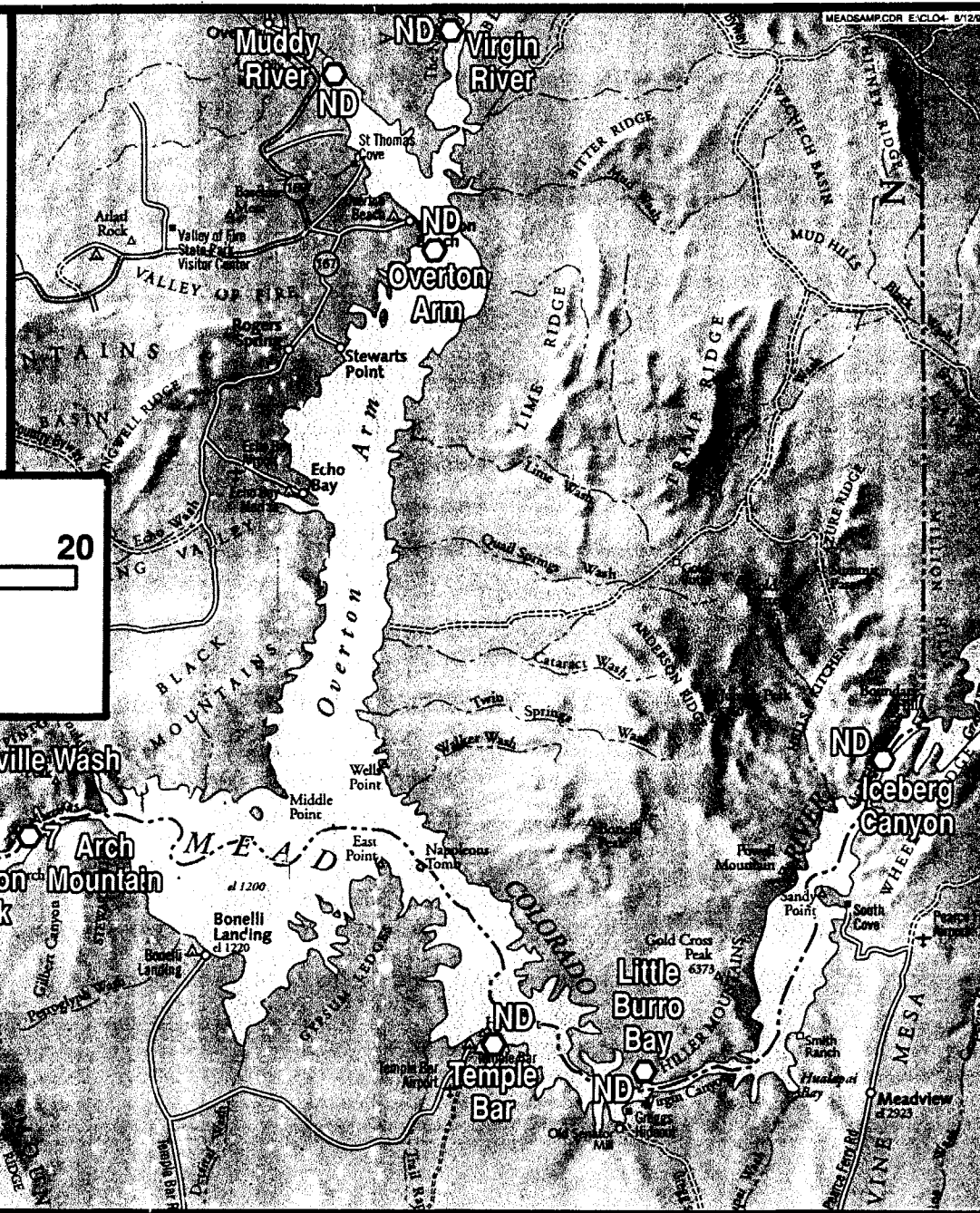


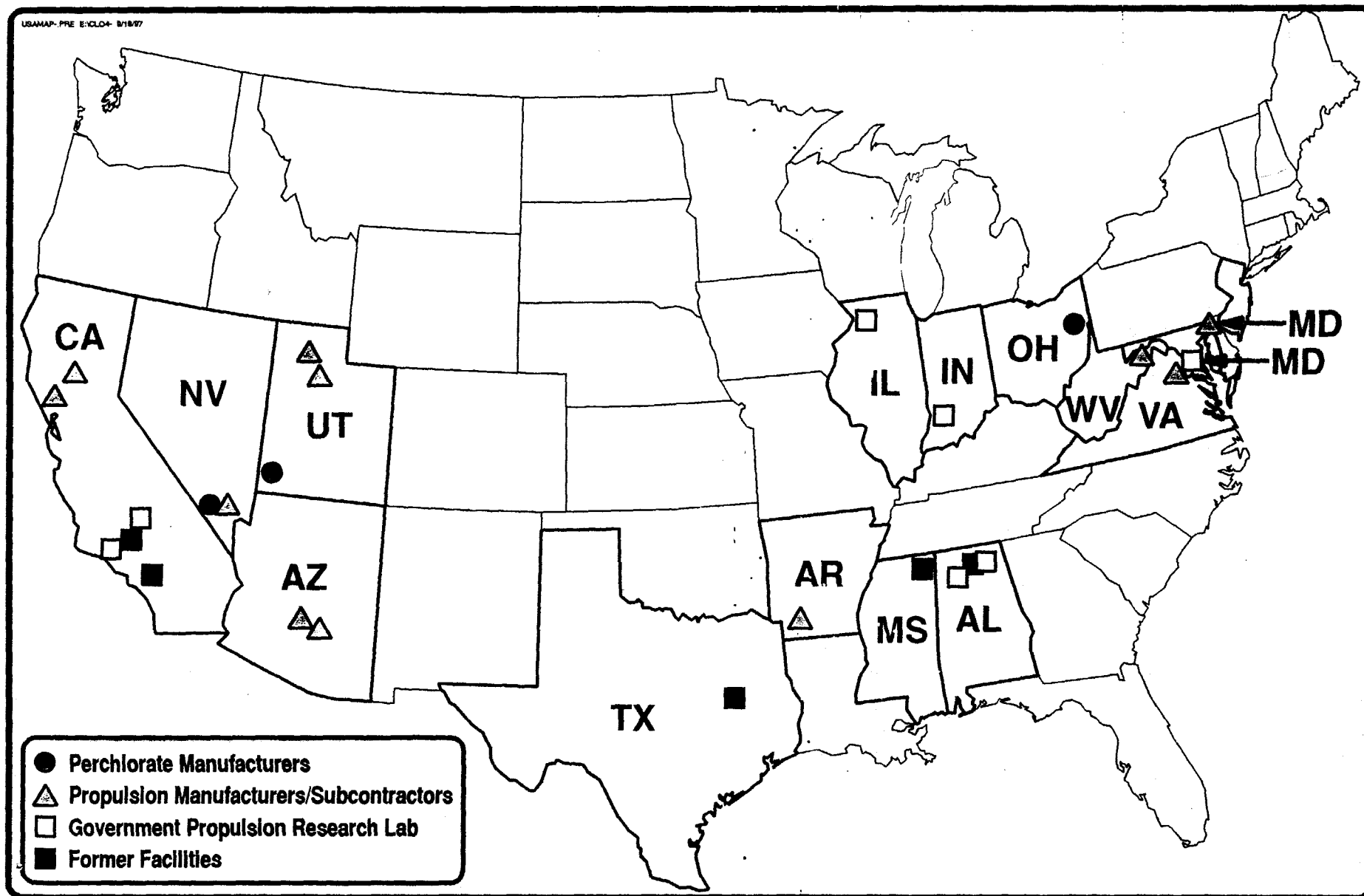
**Perchlorate Detection in the
Colorado River Watershed**

July 1997 Lake Mead Perchlorate Results ($\mu\text{g/L}$)

Sampled July 23 & 24, 1997

Las Vegas Wash--86	Arch Mountain--7
Las Vegas Bay--42	Overton Arm--ND
Black Island--19	Muddy River--ND
Hoover Dam--15	Virgin River--ND
Beacon Rock--12	Temple Bar--ND
Callville Bay--12	Little Burro Bay--ND
Callville Wash--11	Iceberg Canyon--ND
West End Wash--11	(ND = Not detected)





U. S. Perchlorate Manufacturers and Users Facilities for Propulsion Applications

Perchlorate Results ($\mu\text{g/L}$) in Lake Mead (Boulder Basin) and Las Vegas Wash, August 1, 1997

